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AGILENT TECHNOLOGIES  
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EXAMINER

AMARI, ALESSANDRO V

ART UNIT PAPER NUMBER

2872

DATE MAILED: 03/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/778,661

Applicant(s)

RANKIN ET AL.

Examiner

Alessandro V. Amari

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-- Th MAILING DATE of this communication appears on the cover sheet with the corresponding address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 July 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 and 19-41 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 and 19-41 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☒ Interview Summary (PTO-413) Paper No(s). 7.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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## **DETAILED ACTION**

### ***Response to Supplemental Action***

1. The Supplemental action filed on 23 October 2002 whereby the Examiner asserted that newly amended claims 1-16 and 19-22 and newly submitted claims 23-41 are directed to an invention that is independent or distinct from the invention originally claimed and thus were constructively elected by original presentation is hereby rescinded.

### ***Claim Objections***

2. Claim 20 is objected to because of the following informalities:

Claim 20 is recited as being dependent upon itself. For the purposes of examination, claim 20 was assumed to be dependent on claim 19. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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4. Claims 1-16 and 19-41 are rejected under 35 U.S.C. 102(b) as being anticipated by Lear U.S. Patent 5,633,527.

In regard to claims 1, 9, 24 and 33, Lear discloses (see Figure 8) a vertical cavity surface emitting laser or vertical semiconductor optical filter, comprising an optical cavity, including: a first non-concave reflector or means (62) positioned at a first end of the optical cavity, the reflector being configured to focus light that reflects off the reflector back in an opposite direction to avoid diffraction losses from the optical cavity as shown in Figure 8; and a second non-concave reflector or means (64) positioned at a second end of the optical cavity that receives and reflects light reflected from the first non-concave reflector as described in column 20, lines 24-67 and column 21, lines 1-14.

Regarding claims 2, 10, 25 and 34, Lear discloses (see Figure 8) the first non-concave reflector includes an outer layer of material (44) that has a thickness that varies as a function of radial distance out from an axial center of the outer layer as described in column 20, lines 24-67 and column 21, lines 1-14.

Regarding claims 3, 11, 26 and 35, Lear discloses wherein the outer layer includes a substantially convex, semispherical outer surface (14) and a substantially planar inner surface as shown in Figure 8 and as described in column 10, lines 43-50.

Regarding claims 4, 12, 27 and 36, Lear discloses (see Figure 8) that the first non-concave reflector includes an outer layer of material (28) that has an index of refraction that varies as a function of radial distance out from an axial center of the outer layer as described in column 20, lines 24-67 and column 21, lines 1-14.

Regarding claims 5, 13, 28 and 37, Lear discloses that the outer layer is substantially planar as shown in Figure 8.

Regarding claim 6, 14, 29 and 38, Lear discloses that the reflectors include a plurality of material layers oriented in a stacked arrangement as shown in Figure 8 and as described in column 20, lines 24-28.

Regarding claim 7, 15, 30 and 39, Lear discloses that the material layers have different indices of refraction than adjacent material layers as described in column 16, lines 29-46.

Regarding claim 8, 16, 31 and 40, Lear discloses that the material layers have quarter wave optical thicknesses as described in column 16, lines 29-46.

Regarding claims 23 and 32, Lear further discloses (see Figure 8) a semiconductor substrate (12) upon which the laser is formed, the optical cavity being positioned perpendicular to the semiconductor substrate; and wherein the laser emits light in a direction perpendicular to the semiconductor substrate as shown in Figure 8.

In regard to claim 19, Lear discloses (see Figure 8) a vertical cavity surface emitting laser, comprising an optical cavity, including: a first reflector (64) positioned at a first end of the optical cavity, the first reflector including a layer of material (14, 28) that has an index of refraction that varies as a function of radial distance out from an axial center of the layer such that the first reflector is configured to focus light that reflects off the first reflector to avoid diffraction losses from the optical cavity and a second reflector (62) positioned at a second end of the optical cavity that receives and reflects light

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reflected from the first reflector as shown in Figure 8 and as described in column 20, lines 24-67 and column 21, lines 1-14.

Regarding claim 20, Lear discloses that the outer layer is substantially planar as shown in Figure 8.

In regard to claim 21, Lear discloses (see Figure 8) a method for manipulating light in a vertical cavity surface emitting laser, comprising: reflecting light between two reflectors (62, 64) of an optical cavity of the laser; and focusing the light with a layer of material (14, 28) having a thickness that varies as a function of radial distance out from an axial center of the layer to reduce diffraction losses as described in column 20, lines 24-67 and column 21, lines 1-14.

In regard to claim 22, Lear discloses (see Figure 8) a method for manipulating light in a vertical cavity surface emitting laser, comprising: reflecting light between two reflectors (62, 64) of an optical cavity of the laser; and focusing the light with a layer of material (14, 28) having an index of refraction that varies as a function of radial distance out from an axial center of the layer to reduce diffraction losses as described column 20, lines 24-67 and column 21, lines 1-14.

In regard to claim 41, Lear discloses (see Figure 8) a method for manipulating light in a vertical semiconductor optical filter, comprising reflecting light between two reflectors (62, 64) of an optical cavity of the optical filter and focusing the light with a layer of material (14, 28) having a thickness that varies as a function of radial distance out from an axial center of the layer to reduce diffraction losses as shown in Figure 8 and as described in column 20, lines 24-67 and column 21, lines 1-14.

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5. Claims 1, 6-9, 14-16, 23, 24, 29-33, and 38-40 are rejected under 35

U.S.C. 102(e) as being anticipated by Tayebati et al. U.S. Patent 6,438,149.

In regard to claims 1, 9, 24 and 33, Tayebati et al discloses (see Figures 1, 2, 3E) a vertical cavity surface emitting laser or vertical semiconductor optical filter, comprising an optical cavity, including: a first non-concave reflector or means (12) as described in column 4, lines 1-4 and as shown in Figure 3E positioned at a first end of the optical cavity as shown in Figures 1 2, and 3E, the reflector being configured to focus light that reflects off the reflector back in an opposite direction to avoid diffraction losses from the optical cavity; and a second non-concave reflector or means (10) positioned at a second end of the optical cavity that receives and reflects light reflected from the first non-concave reflector as shown in Figures 1, 2 and 3E.

Regarding claim 6, 14, 29 and 38, Tayebati et al. discloses that the reflectors include a plurality of material layers oriented in a stacked arrangement as shown in Figures 1 and 2 and as described in column 3, lines 6-10 and 53-62.

Regarding claim 7, 15, 30 and 39, Tayebati et al. discloses that the material layers have different indices of refraction than adjacent material layers as described in column 3, lines 6-10 and 53-62.

Regarding claim 8, 16, 31 and 40, Tayebati et al discloses that the material layers have quarter wave optical thicknesses as described in column 4, lines 27-30.

Regarding claims 23 and 32, Tayebati et al further discloses a semiconductor substrate upon which the laser is formed, the optical cavity being positioned

perpendicular to the semiconductor substrate (24); and wherein the laser emits light in a direction perpendicular to the semiconductor substrate as shown in Figures 1 and 2.

***Response to Arguments***

6. Applicant's arguments with respect to claims 1-16 and 19-22 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Bryan et al U.S. Patent 5,248,634 also teaches a vertical cavity surface emitting laser or vertical semiconductor optical filter comprising an optical cavity including a first non-concave reflector positioned at one end of the cavity and a second non-concave reflector positioned at a second end of the cavity in order to receive and reflect light reflected from the first non-concave reflector as shown in Figure 3.

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of



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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alessandro V. Amari whose telephone number is (703) 306-0533. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on (703) 308-1687. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

ava *am*  
March 3, 2003

  
**MARK A. ROBINSON**  
**PRIMARY EXAMINER**